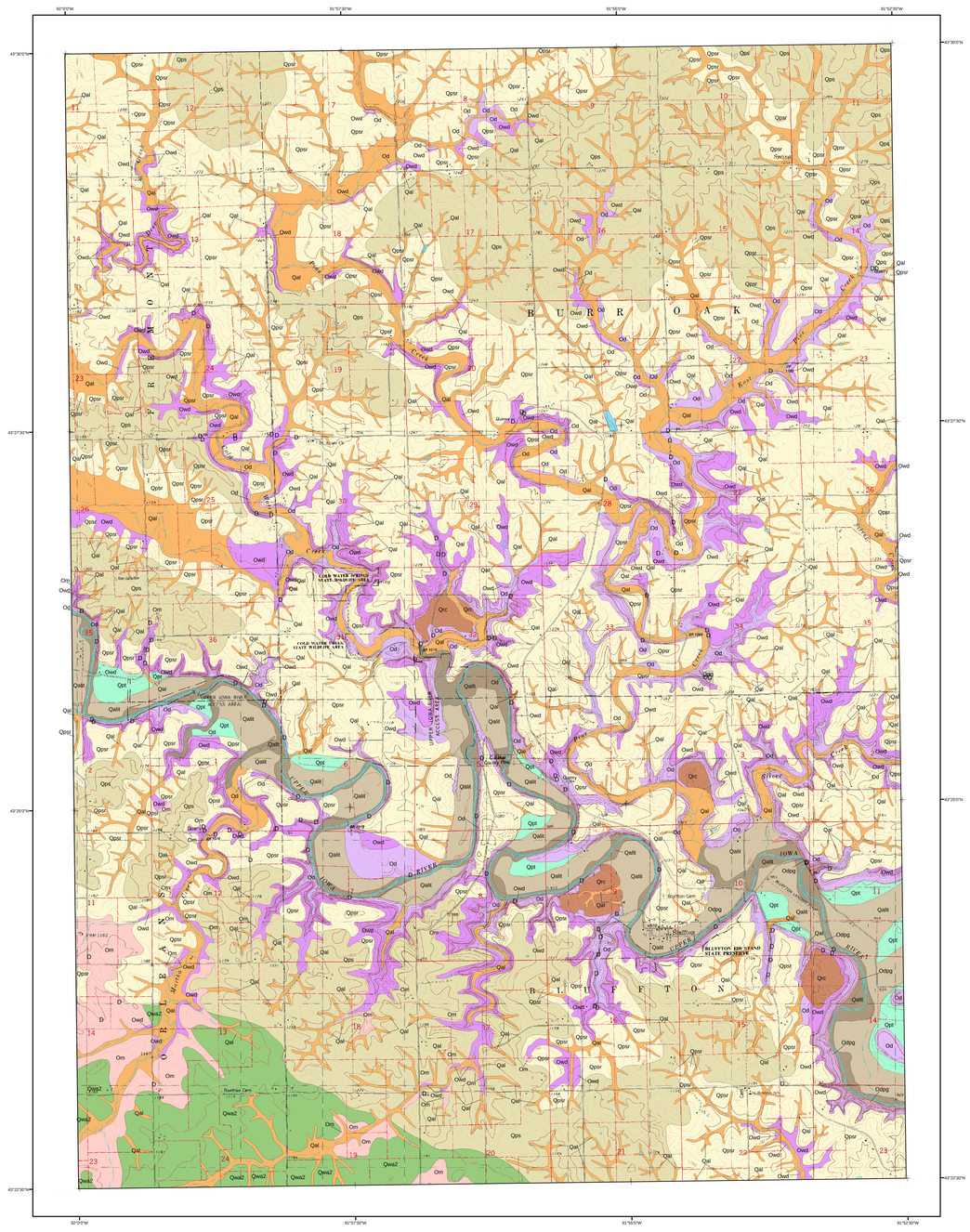
Surficial Geology of the Bluffton (Iowa) 7.5' Quadrangle



1:24,000

0 0.5 1 2 3 4 Miles

0 0.5 1 2 3 4 Kilometers

Quadrangle Location

Base map from USGS Bluffton 7.5' Digital Raster Graphic (IGS GIS file DRGB39.TIF) which was scanned from the Bluffton 7.5' Topographic Quadrangle map, published by US Geological Survey in 1981
Topographic contours and land features based on 1975 aerial photography, field checked in 1977
Land elevation contours (20' interval) based on NGVD 1929

Iowa Geological Survey digital cartographic file Blufftonquad06.mxd, version 6/28/06 (ArcGIS 9.0)
Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15, datum NAD83

Adjacent 7.5' Quadrangles

GEOLOGIC MAPPING OF THE UPPER IOWA RIVER WATERSHED PHASE 2: Bluffton 7.5' Quadrangle

Iowa Geological Survey
Open File Map OFM-06-5
July 2006

prepared by

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LEGEND

Description of Map Units

Cenozoic

Quaternary System

Holocene Epoch

Qal - Alluvium (De Forest Formation-Undifferentiated) One to four meters (3 to 13 ft) of massive to weakly stratified, grayish brown to brown loam, silt loam, clay loam, or loamy sand overlying less than three meters (10 ft) of poorly to moderately well sorted, massive to moderately well stratified, coarse to fine feldspathic quartz sand, pebbly sand, and gravel and more than three meters (10 ft) of pre-Wisconsin or late Wisconsin Noah Creek Formation sand and gravel. Also includes colluvium derived from adjacent map units in stream valleys, on hillslopes, and in closed depressions. Seasonal high water table occurs in this map unit.

Qalt - Upper Iowa River Valley- Low Terrace/Modern Channel Belt (DeForest Formation-Camp Creek Member and Roberts Creek Member) Variable thickness of less than 1 m to 5 m (3 to 16 ft) of very dark gray to brown, noncalcareous, stratified silty clay loam, loam, or clay loam, associated with the modern channel belt of the Upper Iowa River valley. On-bow lakes and meander scars are common features associated with this terrace level. Post-settlement alluvium thickness varies from 0.5 m (1.5 ft) in higher areas to 2 m (6.5 ft) along the river course and in lower lying areas. Seasonal high water table and frequent flooding potential.

Qalit - Upper Iowa River Valley - Intermediate Terrace (DeForest Formation-Camp Creek Member, Roberts Member and Gunder Member) Variable thickness of less than 1 m to 5 m (3 to 16 ft) of very dark gray to brown, noncalcareous, stratified silty clay loam to loam that overlies calcareous, medium- to coarse-grained sand and gravel of Wisconsinan (Noah Creek Formation) and/or pre-Wisconsinan age. Occupies low terrace position. Seasonal high water table and frequent flooding potential

Wisconsin Episode

Qpt - High Terrace - either Late Phase or Early Phase (Peoria Formation – silt and/or sand facies) Two to seven meters (6.5 to 23 ft) of yellowish brown to gray, massive, jointed, calcareous or noncalcareous, silt loam and intercalated fine to medium, well sorted sand. May grade downward to poorly to moderately well sorted, moderately to well stratified, coarse to fine feldspathic quartz sand, pebbly sand, loam, or silt loam alluvium (Late Phase) or may overlie a Farmdale Geosol developed in Roxanna Silt which in turn overlies a well-expressed Sangamon Geosol developed in poorly to moderately well sorted, moderately to well stratified, coarse to fine sand, loam, or silt loam alluvium (Early Phase).

Qps - Loess (Peoria Formation—silt facies) Generally 2 m to 8 m (6 to 27 ft) of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. Overlies massive, fractured, loamy glacial till of the Pre-Illinoian Wolf Creek or Alburnett formations with or without intervening clayey Farmdale/Sangamon Geosol. In most areas the Pre-Illinoian till is 1 m to 5 m (3 to 16 ft) thick, but may be up to 10 m (33 ft) thick locally. This mapping unit encompasses upland divides, ridge-tops and convex-side slopes. Well to somewhat poorly drained landscape.

Qpsr - Loess over Bedrock (Peoria Formation—silt facies) Generally 2 to 8 m (6 to 27 ft) of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. Overlies Ordovician bedrock units or colluvium. This mapping unit encompasses upland divides, ridge-tops and convex side-slopes. Well to somewhat poorly drained landscape.

Qwa2 - Loamy and Sandy Sediment Shallow to Glacial Till (sediment associated with erosion surface) One to three meters (3 to 10 ft) of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment. Map unit includes some areas mantled with less than two meters (6.5 ft) of Peoria Formation-silt facies (loess). Overlies massive, fractured, firm glacial till of the Wolf Creek and/or Alburnett formations. Seasonally high water table may occur in this map unit.

Pleistocene Undifferentiated

Qrc - Rock Core Meanders/Structural Benches - Includes rock core meanders associated with Pre-Wisconsin river development and terrace deposits overlying bedrock benches. Some areas occupy positions as much as 10 m (33 ft) above the modern floodplain. Consists of undifferentiated alluvial and colluvial fill of unknown age and thickness. May be mantled by 1 to 3 m (3 to10 ft) of Peoria Formation-silt facies (loess).

Paleozoic

Ordovician System

Om - Shale, Limestone, and Dolostone (Maquoketa Formation.) A nonresistant slope-forming unit of up to 20 m (65 ft) of interbedded argillaceous limestone, dolostone and grey and brown shale. Fragmentary trilobite fossils are common in the basal Elgin Limestone Member. Forms a confining unit that bounds a karst system in underlying Wise Lake and Dunleith formations, and may host sinkholes in its lower portion.

Owd - Limestone and minor Shale (Wise Lake and overlying Dubuque formation) A prominent ledge and cliff-forming unit of up to 31 m (102 ft) of limestone with notable thin interbedded shale in the upper 6 m (20 ft). This map unit is the upper of two successive major cavern and karst-forming bedrock units in the area. The Wise Lake Formation consists of 21 m (67 ft) of massive limestone portions of which exhibit a distinctive bioturbated fabric. The Dubuque Formation consists of 10 m (34 ft) of crinoidal limestones and thin interbedded shale. Sinkholes are common to abundant within this map unit. Often mantled by 0 m to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

Od - Limestone (Dunleith Formation) A prominent ledge and cliff-forming unit of up to 42 m (137 ft) of limestone with minor thin interbedded shale. This is the lower of two successive major cavern and karst-forming bedrock units in the area. The formation consists of fossiliferous limestone and argillaceous limestone with common chert nodules. Major springs occur near the base and sinkholes and karst features are common. Frequently mantled by 0 m to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

Odpg - Shale, Limestone, and Dolomite (Decorah, and underlying Platteville and Glenwood formations) A nonresistant slope-forming unit of green-grey shales, dense limestones, argillaceous limestones, and dolostone with average thickness of 26 m to 27 m (85 to 90 ft). Large detached slump-blocks of overlying Dunleith Formation limestone often rest on the upper surface of this unit. Forms a regional confining unit that serves as the basal boundary of the karst system in the overlying Dunleith, Wise Lake and Dubuque formations. The upper division, the Decorah Formation, consists of 12 m to 14 m (39 to 46 ft) of green-grey fossiliferous shales with minor interbedded limestones. The middle division, the Platteville Formation, consists of 7.5 m (25 ft) of limestone, argillaceous limestone, and dolostone. The lower division, the Glenwood Formation, consists of 2 m to 3 m (7 to 9 ft) of green-grey shale with minor siltstone to fine sandstone. This map unit, especially the Decorah and Glenwood subdivisions, is rarely exposed and almost everywhere is mantled by 0 m to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

Qpq - Pits and Quarries Sand and gravel pits and rock quarries.

Water Features

Drill Holes

Outcrops